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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,673	01/10/2001	Koji Yotsumoto	P 276510 KO-0021US	4563

7590 09/08/2004
PILLSBURY & WINTHROP LLP
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EXAMINER

VARTANIAN, HARRY

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 09/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/756,673

Applicant(s)

YOTSUMOTO, KOJI

Examiner

Harry Vartanian

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2634

Detailed Action

This action is in response to the amendment filed on 6/10/2004.

Response to Arguments

1. Applicant's arguments filed on 6/10/2004 have been fully considered but they are not persuasive. Interpreting the Claims in the broadest sense, they state that the invention uses at least two correlations values. In the admitted prior art, fig 2 item S14 shows that multiple correlation **values** are stored and then compared to a threshold value. Multiple correlation values are inclusive of at least two correlation values. Parts S10 to S16 of figure 2 are also replicated in figure 11. Moreover, regarding the use of a waveform distortion detector, the applicant specifically defines on page 11, lines 1-3 that "distortion" includes "*interferences between signals, **noises**, etc.*" Therefore noise is a form of waveform distortion. In figure 2, applicant shows that noise is detected by item S20 after correlation values are compared against a threshold. In conclusion, the path recognizing steps in figure 2 do rebut the applicants' arguments.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claim 1 is rejected under 35 U.S.C. 102(a) as being applicants admitted prior art(AAPA) by the applicant. Applicant admits that the following limitations are conventional:

receiving at least one set of signals through a transmission path, said set of signals being comprised of a predetermined number of received signals; **[fig 1 and 2; (pg 1, line 26 to pg 2, line 33)]**

generating at least two each of which has its own delay time, said spread code being comprised of a predetermined number of spread code bits; **[fig 1 and 2; (pg 1, line 26 to pg 2, line 33)]**

calculating at least two correlation values of said set of signals with said at least two spread codes; **[fig 1 and 2; (pg 1, line 26 to pg 2, line 33)]**

Art Unit: 2634

and recognizing said path as a valid receiving path for demodulating said received signals based on said at least two correlation values. [fig 2; (pg 1, line 26 to pg 2, line 33)]

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art in view of Bahai et al(US PAT#6,522,706). Regarding Claims 2 and 4, applicant's admitted prior art meets all the limitations of the Claims except stating the use of a peak correlation and non-peak correlation(Claim 2) value which may be neighboring(Claim 4) values.

However, Bahai et al's path selection method for CDMA using correlation meets the following limitations of Claims 2 and 4:

wherein said at least two correlation values are a peak correlation value and a correlation value other than said peak correlation value. [Fig 1, (column 1, lines 36-42)]

wherein said at least two correlation values are neighboring values. [Fig 1, (Column 3, lines 25-38)]

Therefor it would have been prima facie obvious at the time the invention was made for a CDMA path selection method to use neighboring correlation samples, which include peak and non-peak. A motivation to combine is stated by Bahai et al in column 1, line 59 to Column 2, line 4. More specifically, he states:

"One such scheme is disclosed in U.S. Pat. No. 5,400,368. However, the disclosed scheme does not take any advantage of the shape and roll-off of the correlation of the received signal with the synchronization pattern. In addition, ***the disclosed scheme does not take into consideration the effects of different degrees of delay spread conditions.***"

Regarding Claim 3, Bahai et al meets the following limitations:

wherein said step of recognizing said path (Column 1, lines 36-42) as a valid receiving path comprises

the steps of calculating a plurality of ratios of said peak correlation value to a plurality of correlation values other than said peak correlation value; (Fig 1, Fig 2 step 6; Column 2, lines 11 to Column 3, line 47)

Art Unit: 2634

comparing said plurality of ratios with at least one predetermined comparison threshold value; and **(fig 2, item 8)**

recognizing said path as a valid receiving path for demodulating said received signals based on the result of comparisons of said comparing step. **(Column 4, lines 13-35)**

Regarding Claim 5, Bahai et al meets the following limitations:

wherein said step of recognizing said path as a valid receiving path comprises the steps of calculating a plurality of ratios of a plurality of respectively neighboring correlation values; **(Fig 1, Fig 2 step 6; Column 2, lines 11 to Column 3, line 47)**

comparing said plurality of ratios with at least one predetermined comparison threshold value; **(fig 2, step 8)**

and recognizing said path as a valid receiving path for demodulating said received signals based on the result of comparisons of said comparing step. **(Column 4, lines 13-35); Abstract**

3. Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art in view of Bhagalia et al(US PAT #5,815,798). The applicant admitted prior art meets all the limitations of the Claim(see above paragraphs) except stating the use of a difference between at least two correlation values.

However, Bhagalia et al's path acquisition method meets the following limitation:

wherein said step of recognizing said path as a valid receiving path is the step of recognizing said path as a valid receiving path for demodulating said received signals based on the difference between said at least two correlation values. **[(Column 9, line 36 column 10, line 25); Please see column 10 lines 20-25 for specific reference to differencing and fig 12)]**

Therefor it would have been prima facie obvious at the time the invention was made for a CDMA path selection method to use a difference between at least two correlation values to acquire a valid path. A motivation to combine is that it is well known in the art that a correlation peak can found by seeing if there is a positive or negative difference among two values. Moreover, differencing is used in calculus to find local minima(valleys) and maxima(peak) of functions by measuring changes in slopes. A change in slope entails calculating the differences among values along a curve.

Art Unit: 2634

4. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art in view of Bahai et al(US PAT#6,522,706). Regarding Claim 7, applicant's admitted prior art meets the following limitations:

receiving at least one set of signals through a transmission path, said set of signals being comprised of a predetermined number of received signals; **(pg 1, line 26 to pg 2, line 17)**

generating at least two spread codes each of which has its own delay time, said spread code being comprised of a predetermined number of spread code bits; **(pg 1, line 26 to pg 2, line 17)**

calculating at least two correlation values of said set of signals with said at least two spread codes; **(pg 1, line 26 to pg 2, line 17)**

determining whether there is a distortion on said path waveform; and **(fig 2, item S16 to S24; NOTE: noise is a form of distortion as defined by applicant in page 11, lines 1-3)**

recognizing said path as a valid receiving path for demodulating said received signals based on the result of determination of said determining step. **(fig 2, item 22)**

Applicant's admitted prior art fails to teach the formation of path waveform using correlation values.

However, Bahai et al's path selection method for CDMA discloses a typical path correlation waveform profile comprising multiple samples in fig 1. Therefor it would have been prima facie obvious at the time the invention was made to a create path waveform using correlation values. A motivation to combine is that it is well known in the art that correlation between spread codes and received symbols are used to determine valid paths. This is disclosed by the applicant as prior art on Page 1, lines 13-17.

Regarding Claim 8, Bahai et al meets the following limitations:

wherein said at least two correlation values are a peak correlation value and a correlation value other than said peak correlation value. **(fig 1); (Column 3, Lines 7-32)**

5. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art in view of Bahai et al(US PAT#6,522,706). Regarding Claim 9, applicant's admitted prior art meets the following limitations:

receiving at least one set of signals through a transmission path, said set of signals being comprised of a predetermined number of received signals; **(pg 1, line 26 to pg 2, line 17)**

Art Unit: 2634

generating at least two spread codes each of which has its own delay time, said spread codes being comprised of a predetermined number of spread code bits; (**pg 1, line 26 to pg 2, line 17**)

calculating at least two correlation values of said set of signals with said at least two spread codes; (**pg 1, line 26 to pg 2, line 17**)

comparing said peak correlation value with a predetermined path recognition threshold value; (**fig 2 of applicant item S16 to S24**)

determining whether there is a distortion on said path waveform; and (**fig 2, item S16 to S24; NOTE: noise is a form of distortion as defined by applicant in page 11, lines 1-3**)

recognizing said path as a valid receiving path for demodulating said received signals based on the results of comparison of said comparing step and determination of said determining step. (**fig 2, item 22**)

Applicant's admitted prior art fails to teach the formation of path waveform using at least two correlation values.

However, Bahai et al's path selection method for CDMA discloses a typical path correlation waveform profile comprising multiple samples in fig 1. Therefor it would have been prima facie obvious at the time the invention was made to create a path waveform using multiple correlation values. The motivation to combine is that it is well known in the art that correlation between spread codes and received symbols are used to determine valid paths. This is disclosed by the applicant as prior art on Page 1, lines 13-17.

Regarding Claim 10, Bahai et al meets the following limitations:

when it is determined that said peak correlation value is greater than said predetermined path recognition threshold value and that there is no distortion on said path waveform. (**fig 2, items S16 to S24**)

6. Claims 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art in view of Yugawa(USPAT# 6,233,272). Regarding Claim 11, applicant's admitted prior art meets the following limitations:

a spread code generator for generating at least two spread codes each of which has its own delay time, said spread codes being comprised of a predetermined number of spread code bits; [**fig 1, item 12; (pg 1, line 26 to pg 2, line 17)**]

a correlator for calculating at least two correlation values of said set of signals with said at least two spread codes; and [**fig 1, item 14; (pg 1, line 26 to pg 2, line 17)**]

Applicant's admitted prior art fails to teach the use of a path detector that chooses a path based on correlation values.

Art Unit: 2634

However, Yugawa meets the following limitations:

a path recognizing unit for recognizing said path as a valid receiving path for demodulating said received signals based on said at least two correlation values. **[fig 4, (Column 9, lines 21-38); fig 2c shows a plurality of correlation values]**

Therefor it would have been prima facie obvious at the time the invention was made to use a path detection unit to determine a valid path based on correlation values of spread codes. The motivation to combine is stated by Yugawa in (Column 9, lines 40-52).

7. Claims 12-16 and 18-**21** are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art in view Yugawa(USPAT# 6,233,272) further in view of Bahai et al(US PAT#6,522,706) further in view of ITO (US PAT#6,553,059). AAPA, Yugawa, and Bahai et al meet all the limitations of Claim 12 and 18 including the creation of a waveform using correlation values(See Bahai et al fig 1 and column 2, lines 11-43). They fail to disclose the use of a waveform distortion detector to detect distortions in the correlation waveform.

However, ITO meets the following limitations:

further comprising a waveform distortion detector for determining whether there is a distortion on a path waveform of said path represented as a correlation profile, said correlation profile being formed based on said at least two correlation profile values. **[See (Column 3, lines 10-14) regarding a Correlator used for path selection; See (Column 9, Lines 28-33) and fig 11 for noise detector]**

Therefor it would have been prima facie obvious at the time the invention was made to use a distortion detection unit to determine a valid path based on correlation values. The motivation to combine is that distortion detection can increase the accuracy of a path detection method.

Regarding Claim 13, Bahai et al meets the following limitations:

wherein said at least two correlation values are a peak correlation value and a correlation value other than said peak correlation value. **(fig 1 and column 2, lines 11-43)**

Regarding Claim 14, Bahai et al meets the following limitations:

...said path waveform of said path represented as a correlation profile based on a ratio of said peak correlation value to a plurality of correlation values other than said peak correlation value. **(fig 1 and column 2, lines 11-43)**

Art Unit: 2634

Regarding Claim 15, Bahai et al meets the following limitations:

wherein said at least two correlation values are neighboring correlation values. **(fig 1 and column 2, lines 11-43)**

Regarding Claim 16, Bahai et al meets the following limitations:

...said path waveform of said path represented as a correlation profile based on a plurality of ratios of a plurality of respectively neighboring correlation values. **(fig 1 and column 3, lines 7-67)**

Regarding Claim 19, Bahai et al meets the following limitations:

wherein said at least two correlation values are a peak correlation value and a correlation value other than said peak correlation value. **(fig 1 and column 2, lines 11-43)**

Regarding Claim 20, Bahai et al meets the following limitations:

...on said path waveform of said path represented as a correlation profile based on a ratio of said peak correlation value to a plurality of correlation values other than said peak correlation value.
(fig 1 and column 3, lines 7-67)

Regarding Claim 21, Bahai et al meets the following limitations:

said waveform distortion detector determines the existence of said distortion on said path waveform of said path according to a shape of said correlation profile. **Abstract Note: Delay spread is a form of waveform distortion as defined by the applicant.**

8. Claims 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art in view Yugawa(USPAT# 6,233,272) further in view of Bahai et al(US PAT# 6,522,706) further in view of ITO (US PAT#6,553,059) further in view of Bhagalia et al(US PAT #5,815,798). AAPA, Yugawa, Bahai et al, and ITO meet all the limitations of Claim 17, except stating the use of a difference between at least two correlation values.

However, Bhagalia et al's path acquisition method meets the following limitation:

wherein said step of recognizing said path as a valid receiving path is the step of recognizing said path as a valid receiving path for demodulating said received signals based on the difference between said at least two correlation values. **[(Column 9, line 36 column 10, line 25); Please see column 10 lines 20-25 for specific reference to differencing and fig 12]**

Therefor it would have been prima facie obvious at the time the invention was made for a CDMA path selection method to use a difference between at least two correlation values to acquire a valid path. A motivation to combine is that it is well known in the art that a correlation peak can be found by seeing if there is a positive or negative difference among two values. Moreover, differencing is used in calculus to find local minima and maxima of

Art Unit: 2634

functions by measuring changes in slopes. A change in slope entails calculating the differences among values along a curve.

9. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art in view Yugawa(USPAT #6,233,272) further in view of Bahai et al(US PAT #6,522,706) further in view of ITO (US PAT #6,553,059) further in view of Enge et al(US PAT #6,031,882). AAPA, Yugawa, Bahai et al, and ITO meet all the limitations of Claim 21 except disclosing the use of determining waveform distortion based on the slope of correlation values.

However, Enge et al:

"Alternatively, the multipath signal strengths and phases are estimated by a least mean squares analysis, using multiple sampling of a correlation function of an expected signal and an arriving composite signal that includes the direct signal and one or more multipath signals. Times of arrival or path delays of the direct signal and the multipath signals are determined separately. Path delays can be determined by at least three approaches: (1) identification of slope transition points in the correlation function $R(\tau)$:"
Abstract

As stated above, the applicant defines one form of waveform distortion as being multipath. (Page 11, lines 1-3) Therefor it would have been prima facie obvious to observe correlation slope values to measure distortion. A motivation to combine is stated by Enge in his background of the invention wherein he states multiple instances wherein slope values are used to detect peaks in correlation profiles. These peaks can be later used for creating a delay profile.

Conclusion

10. Original grounds for rejection for Claims 1-20 stand. Regarding Claims 21-22, applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2634

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry Vartanian whose telephone number is 571.272.3048. The examiner can normally be reached on 10:00-6:30 Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571.272.3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HV

Harry Vartanian
Examiner
Art Unit 2634


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Application/Control Number: 09/756,673

Art Unit: 2634

Page 11